

## THE RECIPROCATING STEAM-ENGINE

the slippers between which the crosshead block fits are provided to take the shearing caused by the inertia and friction of the slippers. The working face of the slipper usually consists of white metal, cast in grooves on the metal, often in the form of strips, the surface being such as to give a pressure of 50 to 70 lb. per square inch taken when the crank is at right angles to the line of stroke.

When there **is** only a single guide, the pressure on the guide strips for astern working should not exceed 60 to 80 lb. per square inch. With this type of guide the strips are subject to a force tending to tear them off the supporting bolts when the ship is running astern, and they should be designed to resist the bending action set up. They are usually of cast iron,

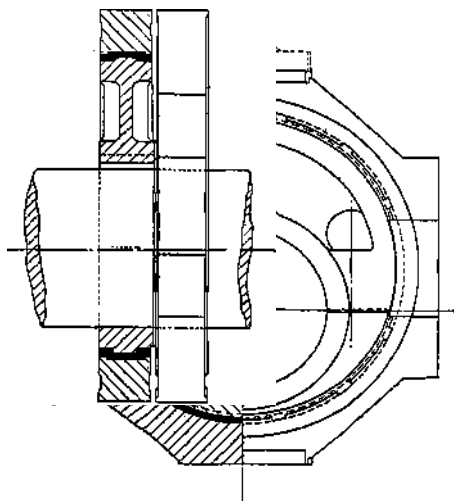


Fig. 31.—Eccentric Pulley and Straps

and the stress should be kept low, say 1500 lb. per square inch, especially as there is a sharp internal corner. The bolts should have a stress of 3500 to 4000 lb. per square inch at bottom of thread. They are spaced about 6 to 7 diameters apart, and all of them may be taken as acting together to resist the lifting action of the connecting-rod.

**Eccentrics and Valve Gear.**—The eccentric pulley is of course split, both parts being often of cast iron, fig. 31. The thickness at the centre of the smaller part may be  $\frac{1}{2}d + J$  in. (*d* in. being the diameter of shaft). The two parts are fixed on the shaft by studs which are screwed into the smaller part, a single nut often being used at the other end. The diameter of these

studs may be based on the loads used for designing the valve gear. The two parts are held in place laterally by a groove-and-feather joint, the feather usually being formed on the smaller part. In small engines there may not be room for nuts on the ends of the studs, and it would then be necessary to use cotters. The eccentric straps are also made of cast iron, and lined with white metal in the usual way, and are usually made of plain rectangular section with corners rounded. The breadth of the eccentric pulley